

**WHAT IS CLAIMED IS:**

- 1     1.     A method of transmitting data in a power transmission network that has at least one  
2         power transmission line, the power transmission line carrying power in the form of time-  
3         varying voltage and current, wherein the time-varying current results in interdependent  
4         electric and magnetic field components, the method comprising:  
5             transmitting data on the power transmission line using micro electromagnetic pulses  
6             to modulate the electric field component according to the data.
- 1     2.     The method of claim 1 wherein transmitting data comprises:  
2         providing a data signal generator to generate the data; and  
3         providing a micro electromagnetic pulse generator that generates micro  
4         electromagnetic pulses in accordance with the data to be transmitted.
- 1     3.     The method of claim 2 wherein the electromagnetic pulse generator comprises a  
2         tripler circuit.
- 1     4.     The method of claim 3 further comprising:  
2         providing a shunt coil connected to an output of the tripler circuit.
- 1     5.     The method of claim 2 further comprising:  
2         providing a shunt coil connected to an output of the electromagnetic pulse generator;  
3         and  
4         providing a magnetic field directionalizer, wherein the shunt coil is wrapped around  
5         the magnetic field directionalizer.
- 1     6.     The method of claim 5, wherein the magnetic field directionalizer comprises:  
2         a first set of washers made of a non-conducting and non-magnetizing material;  
3         a second set of washers made of a ferroelectric material;  
4         a rod made of material that acts as a magnetic propagator insulator; and  
5         wherein the first set of washers are interspersed with the second set of washers on the  
6         rod.



- 1     7.     The method of claim 6 further comprising:  
2             providing a metallic tube having a polished inner surface; and  
3             disposing the shunt coil and a portion of the transmission line within the metallic  
4     tube.



- 1     8.     A system for transmitting data in a power distribution network that has at least one  
2     power transmission line, the power transmission line carrying power in the form of time-  
3     varying voltage and current, wherein the time-varying current results in interdependent  
4     electric and magnetic field components, the system comprising:  
5     a data signal generator to generate data to be transmitted;  
6     a micro electromagnetic pulse generator that generates electromagnetic pulses in  
7     accordance with the data to be transmitted; and  
8     wherein the electromagnetic pulses are used to modulate the electric field component  
9     according to the data.
- 1     9.     The system of claim 8, wherein the electromagnetic pulse generator comprises a  
2     tripler circuit.
- 1     10.    The system of claim 9 further comprising a shunt coil connected to an output of the  
2     tripler circuit.
- 1     11.    The system of claim 10 further comprising a magnetic field directionalizer, wherein  
2     the shunt coil is wrapped around the magnetic field directionalizer.
- 1     12.    The system of claim 11, wherein the magnetic directionalizer comprises:  
2     a first set of washers made of a non-conducting and non-magnetizing material;  
3     a second set of washers made of a ferroelectric material;  
4     a rod made of material that acts as a magnetic propagator insulator; and  
5     wherein the first set of washers are interspersed with the second set of washers on the  
6     rod.
- 1     13.    The system of claim 12 further comprising:  
2     a metallic tube having a polished inner surface; and  
3     wherein the shunt coil and a portion of the transmission line are disposed within the  
4     metallic tube.



1     14.     The system of claim 8 further comprising a magnetic field directionalizer coupled to  
2           the micro electromagnetic pulse generator, wherein the magnetic field directionalizer  
3           induces a polarization leap in the magnetic field component to modulate the electric field  
4           component.

1     15.     The system of claim 14 further comprising a collimator adapted to focus the  
2           polarization leap in the magnetic field component on an area near the power transmission  
3           line.



- 1     16.     A method for transmitting data in a power transmission network, with the power  
2             transmission line carrying power in the form of time-varying voltage and current, the  
3             method comprising:  
4                 applying an electromagnetic pulse to induce a polarization leap in a magnetic field  
5                 surrounding the power transmission line; and  
6                 detecting a change in an electric field surrounding the power transmission line caused  
7                 by the polarization leap.
- 1     17.     The method of claim 16 wherein the change in the electric field is detected at a  
2             remote location from a location where the electromagnetic pulse is applied.
- 1     18.     The method of claim 17 wherein the remote location is at least a mile from the  
2             location where the electromagnetic pulse is applied.
- 1     19.     The method of claim 17 wherein applying the electromagnetic pulse comprises  
2             creating a directional rise in the magnetic field.



- 1     20.     A system for transmitting data in a power transmission network, with the power  
2             transmission line carrying power in the form of time-varying voltage and current, the  
3             system comprising:  
4                 means for generating a micro electromagnetic pulse; and  
5                 means for applying the micro electromagnetic pulse to a magnetic field surrounding  
6             the power transmission line to create a directional rise in the magnetic field.
- 1     21.     The system of claim 20 further comprising means for focusing the directional rise in  
2             the magnetic field on an area surrounding the power transmission line.
- 1     22.     The system of claim 20 further comprising means for generating a data signal,  
2             wherein the micro electromagnetic pulse is generated in accordance with the data signal.
- 1     23.     The system of claim 20 further comprising means for insulating the power  
2             transmission line from the means for applying the micro electromagnetic pulse.